

REMARKS

Claims 27-51 are pending in the present application.

The rejections of:

- (a) Claims 27-34, 36-40, 42, 44, 46, and 50 under 35 U.S.C. §103(a) over Podszun in view of Neev;
- (b) Claim 35 under 35 U.S.C. §103(a) over Podszun in view of Neev and further in view of Kar;
- (c) Claim 41 under 35 U.S.C. §103(a) over Podszun in view of Neev and further in view of Melisaris and Kawasaki;
- (d) Claims 43, 48, and 49 under 35 U.S.C. §103(a) over Podszun in view of Neev and further in view of Bredt;
- (e) Claims 45 and 48, and 49 under 35 U.S.C. §103(a) over Podszun in view of Neev and further in view of Householder; and
- (f) Claim 47 under 35 U.S.C. §103(a) over Podszun in view of Neev and further in view of Melisaris-2,

are respectfully traversed.

The present invention provides, inter alia, a A process for producing a three-dimensional object comprising

providing a layer of a pulverulent substrate,

selectively applying an absorber in a suspension or a liquid absorber via an inkjet

process to a region to be sintered, and

selectively melting regions of the layer of the pulverulent substrate by introducing electromagnetic energy via a laser whose wavelength is ranges from 100 to 3000 nm. (see Claim 27)

The present invention improves upon existing methods heretofore employed in the process of laser-sintering (rapid prototyping) where typically a specific high-end laser (e.g., a CO₂ laser) is employed with a wavelength in the far infrared region (e.g., 10 600 nm). Thus, the claimed invention provides a method by which common lasers that generate electromagnetic radiation with a wavelength of from 100 to 3000 nm can be used. This method is made possible by using a specific absorber is selectively applied via an inkjet process to those regions to be melted of the respective layer.

Podszun is cited by the Examiner as disclosing a laser sintering method with a layer of a pulverulent substrate where a laser (e.g., Nd-YAG) with a wavelength of 500 to 1500 nm is used to sinter particulate plastic powders in a defined three-dimensional object and where an IR absorber is also employed. In the method disclosed by Podszun, controlled sintering is achieved by the selective melting by introduction of electromagnetic energy via a laser. However, at no point do Podszun disclose or suggest the selective application of the absorber by an ink jet process.

This distinction is important as an unexpected effect of the present invention is that selectivity can be achieved merely by printing an absorber instead of via selective focused application by means of a laser (meaning that focusing of the laser is not necessary). Podszun is representative of the art that the claimed invention improves where the selectivity is achieved by selectively guiding the laser beam over the area to be fused.

The specification addresses the problems existing in the art prior to the present invention when selective laser sintering is used, similar to Podszun:

The process of laser-sintering (rapid prototyping) to realize moldings composed of pulverulent polymers is described in detail in the patent specifications US 6,136,948 and WO 96/06881 (both DTM Corporation). The SLS processes described in the prior art have the disadvantage that expensive laser technology is needed for the process. The laser functioning as energy source is extremely expensive and sensitive, as also is the optical equipment needed for the provision and control of the laser beam, for example lenses, expanders, and deflector mirrors.

A disadvantage of the known process is that it cannot use some of the lasers available on the market. In order to permit sintering of polymer powder or of particles encapsulated with plastic, a CO₂ laser is required, which is expensive to purchase and expensive to service, operate, and maintain. A characteristic feature of the CO₂ laser is the wavelength of 10 600 nm. This corresponds to the far infrared region. A complicated mirror system therefore has to be used in order to conduct the laser beam across the construction plane; in addition, the laser requires constant cooling. Optical conductors cannot be used. Specifically trained operating staff generally have to be made available. Many end users are therefore unable to use these systems. However, use cannot be made of lower-cost lasers of wavelength in the middle or near infrared region, in the visible light region, or the ultraviolet region, because these cannot generally melt plastics, or not to the extent required for laser sintering. (see page 1, line 18 to page 2, line 11).

Podszun does not appreciate these problems with mere selective laser sintering. Additionally, none of the secondary references disclose the problems existing in the art represented by Podszun. The Supreme Court has held that the discovery of a problem or a cause of a problem can lend patentability to an invention. The discovery of a problem is often the key to making a patentable invention. Thus, the patentability of an invention under 35 U.S.C. §103 must be evaluated against the background of the highly developed and specific art to which it relates, and this background includes an understanding of those unsolved problems persisting in the art solved by the invention. *See, Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45, 43 S.Ct. 322, 67 L.Ed. 523 (1923).

The Examiner alleges that this deficiencies in Podzun is compensated for by Neev. Applicants disagree at least for the foregoing reason (i.e., Neev does not appreciate the

problems existing in the art represented by Podszun). Applicants further submit the presently claimed invention differs from the combined disclosures of Podszun and Neev with respect to the combination and sequence of the steps. In Neev, for example, a completely different method is claimed, wherein material is chopped or abraded, but not melted and built up in layered parts. Of equal importance, in Neev, the substrate is not pulverulent and, therefore, the absorber is not applied with inkjet technology or is at least contained in a printable fluid in a relevant process.

The Examiner disregards this argument for a number of reasons. First, the Examiner alleges that a specific order of steps is not imposed by the claim language and the specification does not make any such distinction. For example, looking at claim 28, there is no requirement that the pulverulent substrate is provided before the temperature of the manufacturing chamber is controlled. What is missed in this treatment by the Examiner is that Podszun and Neev do not disclose the method of the claimed invention and, necessarily, fail to disclose the specific steps and order thereof.

The Examiner also disregards the argument that the absorber is not applied with inkjet technology in Neev, and the substrate is not pulverulent. With respect to application of the absorber, the Examiner points to the disclosure at column 42, lines 37-42 of applying an absorbing agent through an ejector, which can be similar to an "exemplary ink jet injection technology available from the commercial ink jet printer industry." However, the Examiner is reminded that the substrate and the method disclosed by Neev is not the same or remotely similar to that disclosed by Poszun or claimed in the present application. Indeed, in Neev a completely different method is claimed, wherein material is chopped or abraded, but not melted and built up in layered parts. This is not what is occurring in the presently claimed invention.

The Examiner also points to Podszun as disclosing the pulverulent substrate. Podszun may disclose a pulverulent substrate; however, the substrate and method of Podszun are in no way the same as in Neev. Thus, the artisan in possession of Podszun and Neev would not be motivated to selectively insert the absorber disclosed by Neev into the process of Podszun without also modifying the process of Podszun and the substrate of Podszun to be compatible with the entirety of the disclosure of Neev.

Thus, Podszun and Neev fail to provide any suggestion that their technology and processes could in any way be combined. Even if it is the Examiner's position that modifications in the cited references would have been within the general abilities of the skilled artisan, a statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

KSR International Co. v. Teleflex Inc., 550 U.S.____, 82 USPQ2d 1385 (2007) does not eliminate the "obvious to try is not obvious" standard, as it clearly states that "obvious to try" may constitute obviousness, but only under certain circumstances. Specifically, *KSR* stated that the fact that a claimed combination of elements was "obvious to try" might show that such combination was obvious under 35 U.S.C. § 103, since, if there is design need or market pressure to solve problem, and there are finite number of identified, predictable solutions, person of ordinary skill in art has good reason to pursue known options within his or her technical grasp, and if this leads to anticipated success, it is likely product of ordinary

skill and common sense, not innovation. However, the Examiner offers nothing to show how these factors apply and whether there would be such an expectation or anticipated success.

Applicants respectfully submit that the Examiner has not offered any evidence that there is a recognized “design need or market pressure to solve the problem”. Indeed, the cited references make no suggestion that such a need even exists. Further, the Examiner fails to show that there are a “finite number of identified, predictable solutions”. In fact, there is nearly an infinite number of ways that the references may be combined with respect to the various components and steps disclosed therein. The Examiner also does not provide any evidence that a “person of ordinary skill in art has good reason to pursue known options within his or her technical grasp”. It is clear from the references themselves that the artisan had no such reason to modify the various disclosures to arrive at the claimed invention. All that the Examiner appears to provide is that arriving at the combination of components may be within the general abilities of the skilled artisan, but again this is not the proper standard for obviousness (*Ex parte Levensgood*). Indeed, absent Applicants disclosure to serve as the guidepost, no objective reason to combine the teachings in a way that would place the artisan in possession of the claimed invention can be found.

At best, the combined disclosures could be taken as an “invitation to experiment” or could be viewed as providing an “obvious to try” argument. However, “obvious to try” has long been held not to constitute obviousness. *In re O'Farrell*, 7 USPQ2d 1673, 1680 81 (Fed. Cir. 1988). A general incentive does not make obvious a particular result, nor does the existence of techniques by which those efforts can be carried out. *In re Deuel*, 34 USPQ2d 1210, 1216 (Fed. Cir. 1995).

Moreover, the Examiner is reminded that to rely on a reference under 35 U.S.C. 103, it must be analogous prior art (MPEP 2141.01(a)). Applicants submit that there is nothing

analogous in the disclosed methods of Podszun and Neev. Indeed, for the reasons given above, the method of Neev is different from the claimed method and the method disclosed by Podszun in virtually every way not least of which is the actual method and the substrate to be used in the methods. Accordingly, the skilled artisan would have had no reason to consider the disclosure of Neev together with the disclosure of Podszun, since these relate to completely different types of processes.

The Examiner alleges that Podszun and Neev represent analogous art. However, this allegation by the Examiner ignores the fact that the artisan is asked to take multiple leaps involving the method and the substrates for the method to make the substitutions/modifications alleged. As such, Podszun and Neev have no relation to each other. As such, the artisan in possession of Podszun and Neev would not be motivated to selectively insert the absorber disclosed by Neev into the process of Podszun without also modifying the process of Podszun and the substrate of Podszun to be compatible with the entirety of the disclosure of Neev.

None of Kar, Melisaris, Kawasaki, Brecht, or Melisaris-2 cure this basic deficiencies in the disclosures of Podszun and Neev. Therefore, even when Podszun and Neev are viewed together with Kar, Melisaris, Kawasaki, Brecht, and/or Melisaris-2, the claimed invention would still not be obvious.

Withdrawal of these grounds of rejection is requested.

Finally, Applicants respectfully request that the provisional obviousness-type double patenting rejections of Claims 27-30 and 36-50 over Claims 27-29 and 35-49 of co-pending U.S. 11/587,758 be held in abeyance until an indication of allowable subject matter in the

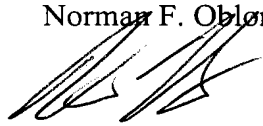
present application. If necessary, a terminal disclaimer will be filed at that time. Until such a time, Applicants make no statement with respect to the propriety of this ground of rejection.

However, the Examiner is reminded that MPEP §804 indicates that: "If "provisional" ODP rejections in two applications are the only rejections remaining in those applications, the examiner should withdraw the ODP rejection in the earlier filed application thereby permitting that application to issue without need of a terminal disclaimer."

Applicants submit that the present application is now in condition for allowance.
Early notification of such action is earnestly solicited.

Respectfully submitted,

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